



HJV gene

hemojuvelin BMP co-receptor

Normal Function

The *HJV* gene provides instructions for making a protein called hemojuvelin. This protein is made in the liver, heart, and muscles used for movement (skeletal muscles). Hemojuvelin plays a role maintaining proper iron levels in the body by controlling the levels of another protein called hepcidin. Hepcidin is necessary for maintaining an appropriate balance of iron (iron homeostasis) in the body.

Health Conditions Related to Genetic Changes

Hereditary hemochromatosis

More than 30 *HJV* gene mutations have been found to cause type 2 hemochromatosis, a form of hereditary hemochromatosis that begins during childhood or adolescence. Hereditary hemochromatosis is a disorder that causes the body to absorb too much iron from the diet. The excess iron accumulates in, and eventually damages, the body's tissues and organs.

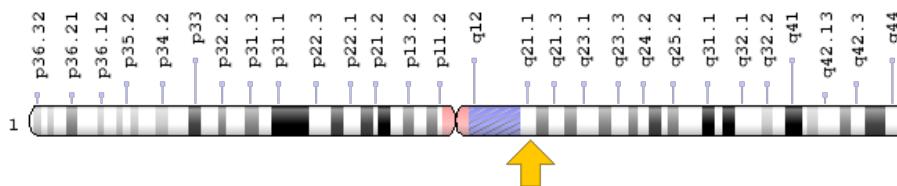
Most *HJV* gene mutations change one of the protein building blocks (amino acids) used to make hemojuvelin. Most frequently, the amino acid glycine is replaced by the amino acid valine at protein position 320 (written as Gly320Val or G320V). Other mutations create a premature stop signal in the instructions for making the hemojuvelin protein resulting in an abnormally small protein.

Mutations in the *HJV* gene lead to an altered hemojuvelin protein that cannot function properly. Without adequate hemojuvelin, hepcidin levels are reduced and iron homeostasis is disturbed. As a result, too much iron is absorbed during digestion, which leads to iron overload and damage to tissues and organs in the body that is found in hereditary hemochromatosis.

Chromosomal Location

Cytogenetic Location: 1q21.1, which is the long (q) arm of chromosome 1 at position 21.1

Molecular Location: base pairs 146,017,470 to 146,021,735 on chromosome 1 (Homo sapiens Updated Annotation Release 109.20200522, GRCh38.p13) (NCBI)



Credit: Genome Decoration Page/NCBI

Other Names for This Gene

- hemochromatosis type 2 (juvenile)
- HFE2
- HFE2A
- JH
- RGM domain family, member C
- RGMC
- RGMC_HUMAN

Additional Information & Resources

Clinical Information from GeneReviews

- Juvenile Hemochromatosis
<https://www.ncbi.nlm.nih.gov/books/NBK1170>

Scientific Articles on PubMed

- PubMed
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28HFE2%5BTIAB%5D%29+OR+%28hemochromatosis+type+2%5BTIAB%5D%29+OR+%28hemochromatosis+AND+1q%5BTIAB%5D%29%29+OR+%28%28hemojuvelin%5BTIAB%5D%29+OR+%28HFE2A%5BTIAB%5D%29+OR+%28HJV%5BTIAB%5D%29%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D>

Catalog of Genes and Diseases from OMIM

- HEMOJUVELIN
<http://omim.org/entry/608374>

Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology
http://atlasgeneticsoncology.org/Genes/GC_HJV.html
- ClinVar
<https://www.ncbi.nlm.nih.gov/clinvar?term=HJV%5Bgene%5D>
- HGNC Gene Symbol Report
https://www.genenames.org/data/gene-symbol-report/#!/hgnc_id/HGNC:4887
- Monarch Initiative
<https://monarchinitiative.org/gene/NCBIGene:148738>
- NCBI Gene
<https://www.ncbi.nlm.nih.gov/gene/148738>
- UniProt
<https://www.uniprot.org/uniprot/Q6ZVN8>

Sources for This Summary

- Babitt JL, Huang FW, Wrighting DM, Xia Y, Sidis Y, Samad TA, Campagna JA, Chung RT, Schneyer AL, Woolf CJ, Andrews NC, Lin HY. Bone morphogenetic protein signaling by hemojuvelin regulates hepcidin expression. *Nat Genet.* 2006 May;38(5):531-9. Epub 2006 Apr 9.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/16604073>
- Bardou-Jacquet E, Ben Ali Z, Beaumont-Epinette MP, Loreal O, Jouanolle AM, Brissot P. Non-HFE hemochromatosis: pathophysiological and diagnostic aspects. *Clin Res Hepatol Gastroenterol.* 2014 Apr;38(2):143-54. doi: 10.1016/j.clinre.2013.11.003. Epub 2013 Dec 8. Review.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/24321703>
- Beutler L, Beutler E. Hematologically important mutations: iron storage diseases. *Blood Cells Mol Dis.* 2004 Jul-Aug;33(1):40-4. Review.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/15223009>
- Core AB, Canali S, Babitt JL. Hemojuvelin and bone morphogenetic protein (BMP) signaling in iron homeostasis. *Front Pharmacol.* 2014 May 13;5:104. doi: 10.3389/fphar.2014.00104. eCollection 2014. Review.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/24860505>
Free article on PubMed Central: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4026703/>
- Gerhard GS, Paynton BV, DiStefano JK. Identification of Genes for Hereditary Hemochromatosis. *Methods Mol Biol.* 2018;1706:353-365. doi: 10.1007/978-1-4939-7471-9_19. Review.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/29423808>
- Lanzara C, Roetto A, Daraio F, Rivard S, Ficarella R, Simard H, Cox TM, Cazzola M, Piperno A, Gimenez-Roqueplo AP, Grammatico P, Volinia S, Gasparini P, Camaschella C. Spectrum of hemojuvelin gene mutations in 1q-linked juvenile hemochromatosis. *Blood.* 2004 Jun 1;103(11):4317-21. Epub 2004 Feb 24.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/14982873>

- Papanikolaou G, Samuels ME, Ludwig EH, MacDonald ML, Franchini PL, Dubé MP, Andres L, MacFarlane J, Sakellaropoulos N, Politou M, Nemeth E, Thompson J, Risler JK, Zaborowska C, Babakaiff R, Radomski CC, Pape TD, Davidas O, Christakis J, Brissot P, Lockitch G, Ganz T, Hayden MR, Goldberg YP. Mutations in HFE2 cause iron overload in chromosome 1q-linked juvenile hemochromatosis. *Nat Genet*. 2004 Jan;36(1):77-82. Epub 2003 Nov 30.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/14647275>
 - Pissia M, Polonifi K, Politou M, Lilakos K, Sakellaropoulos N, Papanikolaou G. Prevalence of the G320V mutation of the HJV gene, associated with juvenile hemochromatosis, in Greece. *Haematologica*. 2004 Jun;89(6):742-3.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/15194541>
 - Roetto A, Totaro A, Cazzola M, Cicilano M, Bosio S, D'Ascola G, Carella M, Zelante L, Kelly AL, Cox TM, Gasparini P, Camaschella C. Juvenile hemochromatosis locus maps to chromosome 1q. *Am J Hum Genet*. 1999 May;64(5):1388-93.
Citation on PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/10205270>
Free article on PubMed Central: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1377875/>
-

Reprinted from Genetics Home Reference:

<https://ghr.nlm.nih.gov/gene/HJV>

Reviewed: February 2019

Published: June 23, 2020

Lister Hill National Center for Biomedical Communications

U.S. National Library of Medicine

National Institutes of Health

Department of Health & Human Services